

## CALCULATING AND APPLYING THE ANNUAL CONSUMPTIVE QUANTITY (ACQ)

Resource Contact: Policy and Planning Section

Effective Date: 07/12/04

Revised: NEW

References: Chapter 90.03.380(1) RCW

**Purpose:** In accordance with RCW 90.03.380(1), the Water Resources Program is required to determine that the annual consumptive quantity under a water right proposed for a change to add acreage to an irrigation right or to add purposes of use is no greater after the change.

**Definition:** Annual Consumptive Quantity means the estimated or actual annual amount of water diverted pursuant to the water right, reduced by the estimated annual amount of return flows, averaged over the two years of greatest use within the most recent five-year period of continuous beneficial use of the water right.

1. Data Sources: Calculation of the ACQ can be made through analysis of one of more of the following: (1) flow meter, (2) power meter, (3) crop production or sales, (4) aerial photography or maps combined with Washington Irrigation Guide (WIG)/consumptive use estimates (i.e. Blanney-Criddle calculation, Public Agricultural Weather System (PAWS), etc.), or (5) affidavits demonstrating water use. The most accurate data sources should be used based upon the best professional judgment of the permit writer. Accordingly, water use estimates should be compared across a variety of multiple data sources to obtain the most accurate assessment of water use. For example, the use of aerial photography and crop irrigation requirement (CIR) data generally would be less preferable than flow meter or power meter data, unless the power or flow meter data was deemed to be flawed or unreliable. However, flow meter or power meter data could be corroborated by aerial photos or crop data.
2. “Continuous Beneficial Use: Five years of continuous use are required by RCW 90.03.380, although use during some or all of the five years may be only a small fraction of the claim or right. Complete nonuse of a water right in a year or season, even if excused due to a qualifying sufficient cause for relinquishment, does not constitute continuous use, but rather is a discontinuous use. Because a five-year period of continuous use of the water is required, applications for change where there is no five-year period of continuous beneficial use, cannot be approved.
3. Period of Evaluation: the definition requires evaluation of the “most recent five-year period of continuous beneficial use.” Where more than one five-year period of continuous beneficial use of the water right has historically occurred, the most recent period shall be used in this calculation. The first period to consider is the five years immediately preceding the decision date of the application for change or from the date of the Board’s Record of Decision. The first year to be included in the period of evaluation will generally be the full season or year

immediately preceding the decision date of the application for change. Depending on the method of calculation and the availability of metering or power consumption data, it may not be possible to use the most recent season or year because the data is not reasonably available. The permit writer may exercise judgment when determining the availability of data to support the ACQ calculation. However, the principle to be adhered to is, if the data is or should be reasonably available at the time the decision is made, the most recent year should be used. If discontinuous use occurred in the five years immediately preceding the decision date of the application for change, then the permit writer may investigate historic water use to find the “most recent” period of use that is 5 years in length, and is continuous.

4. “Estimated” or “actual” consumptive use. For all practical purposes, every calculated ACQ is an estimate. Always be aware of the limitations in the data and the resulting error in the analysis. Ecology’s water measurement rule (Chapter 173-173 WAC) provides for certain flow meter errors up to ten percent. If questions involving measurement error arise, permit writers are encouraged to seek technical assistance from qualified technical staff.
5. Return flow calculation. Use the WIG, PAWS, or other crop consumptive use estimates to determine evapotranspiration (ET) rates for crops. Use Department of Health, water system planning, or other data and literature to estimate consumptive use for other “units” (i.e. people, cows, etc.). Compare total use to consumptive use estimates. If the total use is less than or equal to the consumptive use, then it may be reasonable to assume nearly all applied water was consumptively used (i.e. deficit irrigation). Use the site inspection to gather information on application methods and system infrastructure to determine the extent of conveyance losses or application inefficiencies. All systems leak. Subsurface leaks are generally considered nonconsumptive because they occur below the root zone. If the total use is far in excess of the consumptive use, then an adjustment may be made for application efficiency that is consumed (i.e. some water from sprinklers evaporates). Manufacturer’s data and research literature can provide specific estimates of efficiencies that can aid in the return flow calculation.
6. Averaging the two years of greatest use. Once the “most recent,” “five-year period” of “continuous beneficial use” of the water right has been selected, the return flow from each year is subtracted from the estimated annual quantity diverted or withdrawn, and the two years of greatest consumptive use are averaged. The statute is protective of the environment in that, unless the consumptive use has not varied, then the consumptive use after the change will be less than the historic peak consumptive use by virtue of a simple mathematical two-year average. This averaging, and indeed the quantification of the consumptive portion of the right, does not alter or diminish the total water right, but rather restricts the consumptive nature of the right after the change. The permit writer has discretion to add a reasonable conveyance loss for the new use, provided that the conveyance factor does not exceed the authorized amount of the water right.
7. Identifying the Annual Consumptive Quantity on Water Rights. The calculated ACQ of the water right should be identified on the face of any superseding documents issued for the water right. The ACQ should also be identified as a condition of approval in the report of examination.

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